REMARKS

Claim 1 and dependent claims

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki, U.S. Patent 5,365,536. Applicants respectfully traverse the rejection.

A. Seki does not teach a III-nitride device

Claim 1 recites, in the preamble, "[a] III-nitride light emitting device . . . ." The Examiner states "Seki discloses in figure 1, a III-nitride light emitting device comprising . . . ." Applicants can find no teaching of a III-nitride device in the text accompanying figure 1, or anywhere else in Seki. The only devices Applicants have found described in Seki are GaAs-based devices, not III-nitride devices. Since Seki fails to teach a III-nitride device, Seki fails to teach or make obvious every element of claim 1, and claim 1 is thus allowable over Seki. Applicants note that MPEP 2111.02 states that "any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation." Since claim 1's preamble limits the structure of claim 1 to a III-nitride device, the preamble must be treated as a claim limitation.

B. The Examiner's Response to Arguments regarding the preamble

The Examiner states in the Response to Arguments section on page 9 of the office action:

> In response to applicant's arguments, the recitation "III-nitride" has not being given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structure limitations are able to stand alone. [Citations omitted.]

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Applicants respectfully disagree. While it is true that statements of purpose or use in the preamble are not treated as claim limitations, MPEP section 2111.02 teaches "[a]ny terminology in the preamble that limits the structure of the claimed invention must be treated

as a claim limitation." One example cited is Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). MPEP 2111.02 states that the Kropa case taught:

> A preamble reciting "An abrasive article" was deemed essential to point out the invention defined by claims to an article comprising abrasive grains and a hardened binder and the process of making it. The court stated "it is only by that phrase that it can be known that the subject matter defined by the claims is comprised as an abrasive article. Every union of substances capable inter alia of use as abrasive grains and a binder is not an 'abrasive article.'" Therefore, the preamble served to further define the structure of the article produced.

The phrase "III-nitride" in the preamble of claim 1 defines the structure of the claimed device. Not every device that includes each element of claim 1 after the preamble will be a III-nitride device. Therefore, as in the Kropa case, the preamble of claim 1 serves to further define the structure claimed in claim 1 and should be considered a claim element.

In addition, Applicants are unsure how the phrase "III-nitride" could be construed as a "purpose of a process or the intended use of a structure." MPEP 2111.02 cites STX LLC. v. Brine, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 as giving one example of a preamble describing a purpose or use. MPEP 2111.02 states the court held "that the preamble phrase 'which provides improved playing and handling characteristics' in a claim drawn to a head for a lacrosse stick was not a claim limitation." Clearly, "III-nitride" is NOT a statement of use like "which provides improved playing and handling characteristics."

For the above reasons, the statement "III-nitride" in the preamble of claim 1 is a substantive part of the claim. Since Applicants can find no teaching in Seki of a III-nitride device, Seki does not teach every element of claim 1 and therefore does not anticipate claim 1.

C. Seki does not teach a reflective contact

In addition, regarding the following element of claim 1: "the first and second contact material has a reflectivity to light emitted by the active region greater than 75%," the Examiner states "[a]lthough Seki does not disclose the first and second contact material has a

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reflectivity to light emitted by the active region greater than 75%, it would have been obvious to one of ordinary skill in the art to adjust the reflectivity of the contact materials to light emitted by the active region, and make the contacts with the same material in order to make the desired light characteristics emitted by the device." Applicants respectfully disagree. There can be no motivation to provide reflective contacts with Seki's figure 1 device because light generated by the active layer of Seki's device does not reach the Seki's electrodes. See, for example, column 3, lines 32-36, which state "Due to a difference in the index of refraction of light between the first undoped active layer 13 and each of the clad layers 12, 14, the laser beam is confined in the first undoped active layer 13." (Emphasis added.) Since the beam is confined within the active layer, no light reaches the contacts of Seki's device. See also, for example, column 4, lines 13-18, which state "The basic structure of the semiconductor laser thus obtained is cleaved in a rectangular form (which is about 350 μm wide, 250 μm deep and 100 μm high), so that a resonator surface of the semiconductor laser is formed on the cleavage plane." The above quoted passages from Seki teach that Seki's contacts are not optically involved in the device. Light is confined within the active layer of Seki's device by Seki's clad layers, then the light escapes through the resonator surface, which is perpendicular to the contacts and the plane of the semiconductor layers. Since light never reaches Seki's electrodes, there is no motivation to make the electrodes reflective. Claim 1 is thus allowable over Seki for this additional reason.

D. The Examiner's Response to Arguments regarding Seki's electrodes

In response to Applicants argument that it is not obvious to make the Seki's contacts reflective because they are not optically involved in the device, the Examiner states on page 8 of the office action:

> Applicants primarily disagree with that the examiner's obviousness statement regarding the reflectivity of the contact materials, as stated above, since applicants reason that the light generated by the active regions does not

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reach the contacts, and the contacts are not optically involved in the device. However, note that the contacts are in fact transparent (see column 4, lines 4-9, wherein it is stated they are gold and gold alloys). Moreover, it is cited in the reference, in one example of the first embodiment that the wavelength of the laser beam radiated from the semiconductor laser is 1.3 or 1.5 micro-meters (see column 6, lines 61 and 62). Also, stated in column 4, lines 17-21, that a resonator surface in the immediate step prior to forming the contacts, acts as a reflecting film, all of which indicate that the laser beam could in fact reach the contacts.

Applicants address in turn the three portions of Seki cited in the above paragraph.

First, Applicants can find no teaching in column 4, lines 4-9 of Seki that suggests that Seki's electrodes are transparent. Column 4, lines 4-9 of Seki are reproduced below:

> An evaporator is used to deposit a p-side electrode 25a (lamination of AuZu layer or the like on Au layer) on the contact layer 21a and an n-side electrode 15a (successive lamination of AuGe layer, Ni layer and Au layer or the like) on the n^+ GaAs substrate 11a to complete the basic structure of the semiconductor laser.
> In the final step of manufacturing, the semiconductor . . .

Nothing in the above passage suggests that the electrodes are transparent. The Examiner's comments seem to suggest that the Examiner believes that because the electrodes are made from gold and gold alloys, they are necessarily transparent. This is simply not the case. Though very thin gold or gold alloy electrodes may be semi-transparent, a person of skill in the art would recognize that gold or gold alloy electrodes may be made opaque. Accordingly column 4 lines 4-9 of Seki do not support the Examiner's position that Seki's electrodes are transparent and that light from Seki's active layer reaches Seki's electrodes.

Second, even if Seki's electrodes *were* transparent and optically involved, such a teaching would *still* not provide a motivation to make the electrodes reflective. Changing transparent electrodes to reflective electrodes, in a device where the electrodes are optically involved, would drastically change the way light escapes the device.

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Third, Applicants fail to see the relevance of the wavelength of light emitted by Seki's device, noted by the Examiner at column 6, lines 60-62, which states "[t]he wavelength of the laser beam radiated from the semiconductor laser is 1.3 or 1.5 μm." The wavelength of light

emitted does not influence the fact that the light generated in the active layers of Seki's devices is confined in the active region away from the electrodes by the clad layers. The light finally escapes the device from the resonator surface formed on the cleavage plane. The light simply does not reach Seki's electrodes.

Fourth, the passage at column 4, lines 17-21 also does not support the Examiner's assertion that light from the active layer reaches Seki's electrodes. Column 4, lines 17-21 are included in the passage below:

> In the final step of manufacturing the semiconductor laser, prior to formation of the n-side electrode 15a, the n^+ GaAs substrate 11a is ground at the lower surface thereof in the drawing so as to have a desired thickness (in the order of 100 μm). The basic structure of the semiconductor laser thus obtained is cleaved in a rectangular form (which is about 350 μm wide, 250 μm deep and 100 μm high), so that a resonator surface of the semiconductor laser is formed on the cleavage plane. The resonator surface is covered with a thin film (not shown) of silicon dioxide (SiO_2), amorphous silicon (Si), aluminum oxide (Al_2O_3) or the like serving as a protective and reflecting film.

Applicants note that the examples of the "reflecting film" formed on the resonator surface referred to in the last sentence are all insulating materials, and thus could not form contacts. Applicants fail to see the relevance of when the electrodes are formed relative to when the resonator surface is formed.

Applicants can find no teaching in Seki of "the first and second contact material has a reflectivity to light emitted by the active region greater than 75%" as recited in claim 1. Seki thus fails to anticipate claim 1. As described above, none of the passages of Seki cited by the Examiner support the Examiner's assertion that light from Seki's active layers ever reaches Seki's electrodes. Accordingly, there is no motivation to make these contacts reflective. Seki thus fails to render claim 1 obvious. Claim 1 is therefore patentable over Seki.

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E. Dependent claims

Claims 2-8 depend from claim 1 and are therefore allowable over Seki for at least the same reasons as claim 1.

Claims 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Murata et al., U.S. Patent 4,732,621 (hereinafter "Murata"). Claims 9-19 depend from claim 1. Murata is cited as teaching "a textured electrode layer" and as such adds nothing to the deficiencies of Seki with respect to claim 1. Claims 9-19 are thus allowable over the combination of Seki and Murata for at least the same reason claim 1 is allowable over Seki.

Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Yagi et al., U.S. Patent 6,642,618 (hereinafter "Yagi"). Claims 20 and 21 depend from claim 1. Yagi is cited as teaching "a submount" and as such adds nothing to the deficiencies of Seki with respect to claim 1. Yagi does teach at column 4, lines 59-60 that the "semiconductor element may consist of . . . InGaN," but the Examiner has supplied no motivation to make the device of Seki out of InGaN, as taught by Yagi. Claims 20 and 21 are thus allowable over the combination of Seki and Yagi for at least the same reason claim 1 is allowable over Seki.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seki and Yagi as applied to claim 21, and further in view of Herring et al., U.S. Patent 6,552,905 (hereinafter "Fischer"). Claim 22 depends from claim 1. Herring is cited as teaching "a heat sink" and as such adds nothing to the deficiencies of Seki with respect to claim 1. Claim 22 is thus allowable over the combination of Seki, Yagi, and Herring for at least the same reason claim 1 is allowable over Seki.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Fischer et al., U.S. Patent 6,309,953 (hereinafter "Fischer"). Claim 23 depends from claim 1. Fischer is cited as teaching "Aluminum contacts" and as such adds nothing to the deficiencies of Seki with respect to claim 1. Claim

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23 is thus allowable over the combination of Seki and Fischer for at least the same reason claim 1 is allowable over Seki.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Fischer and Elliot et al., U.S. Patent 6,593,657 (hereinafter "Elliot"). Claims 24 and 25 depend from claim 1. Elliot is cited as teaching "multilayer contacts" and as such adds nothing to the deficiencies of Seki with respect to claim 1. Claims 24 and 25 are thus allowable over the combination of Seki, Fischer, and Elliot for at least the same reason claim 1 is allowable over Seki. In addition, Applicants can find no suggestion in any of Seki, Fischer, and Elliot that Elliot's contacts are suitable for use in any III-V or III-nitride device. Claims 24 and 25 are thus allowable for this additional reason.

Claim 26 and dependent claims

Claims 26-29 and 36-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Murata. Applicants respectfully traverse the rejection. Neither Seki nor Murata teaches a "III nitride light emitting device" as recited in the preamble of claim 26. Accordingly, even in combination, Seki and Murata do not teach all the elements of claim 26 and claim 26 is allowable over Seki and Murata.

Claims 27-29 and 36-43 depend from claim 26 and are therefore allowable for at least the same reason as claim 26.

Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki in view of Murata as applied to claim 26, and further in view of Boyd et al., U.S. Patent 6,449,439 (hereinafter "Boyd"). Claims 30-32 depend from claim 26. Boyd is cited as teaching "a wire grid polarizer" and as such adds nothing to the deficiencies of Seki and

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Murata with respect to claim 26. Claims 30-32 are thus allowable over Seki, Murata, and Boyd for at least the same reason that claim 26 is allowable over Seki and Murata.

In addition, regarding claim 31, Applicants can find no suggestion in Boyd of forming a "polarization selection layer . . . disposed on the second surface" of a substrate of a light emitting device as recited in claim 31. Boyd spaces polarizer 206 apart from light source 202 such that the light from source 202 can pass through diffuser 204 in order to be more "uniform in brightness." By favoring spacing polarizer 206 apart from light source 202, Boyd teaches away from the disposing a polarization selection layer on a surface of a substrate of a light emitting device.

Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki in view of Murata as applied to claim 26, and further in view of Yagi. Claims 33 and 34 depend from claim 26. Yagi is cited as teaching "a submount" and as such adds nothing to the deficiencies of Seki and Murata with respect to claim 26. Yagi does teach at column 4, lines 59-60 that the "semiconductor element may consist of . . . InGaN," but the Examiner has supplied no motivation to modify the combination of Seki and Murata to include InGaN, as taught by Yagi. Claims 33 and 34 are thus allowable over Seki, Murata, and Yagi for at least the same reason that claim 26 is allowable over Seki and Murata.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seki in view of Murata and Yagi as applied to claim 34, and further in view of Herring. Claim 35 depends from claim 26. Herring is cited as teaching "a heat sink" and as such adds nothing to the deficiencies of Seki and Murata with respect to claim 26. Claim 35 is thus allowable over Seki, Murata, Yagi, and Herring for at least the same reason that claim 26 is allowable over Seki and Murata.

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Claim 44 and dependent claims

Claims 44 and 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki as applied to claim 1, and further in view of Murata. Applicants respectfully traverse the rejection. Neither Seki nor Murata teaches a "III nitride light emitting device" as recited in the preamble of claim 44. Accordingly, even in combination, Seki and Murata do not teach all the elements of claim 44 and claim 44 is allowable over Seki and Murata.

Claims 46-50 depend from claim 44 and are therefore allowable for at least the same reason as claim 44.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seki in view of Murata as applied to claim 44, and further in view of Taskar et al., U.S. Patent 5,990,531 (hereinafter "Taskar"). Claim 45 depends from claim 44. Taskar is cited as teaching a "SiC substrate" and as such adds nothing to the deficiencies of Seki and Murata with respect to claim 44. Taskar does show in the abstract figure a device including GaN, but the Examiner has supplied no motivation to modify Seki and Murata to include GaN, as taught by Taskar. Claim 45 is thus allowable over the combination of Seki, Murata, and Taskar for at least the same reason that claim 44 is allowable over Seki and Murata.

In view of the above arguments, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions, the Examiner is invited to call the undersigned at (408) 382-0480.

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